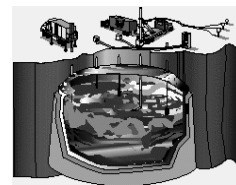




Liquid Membrane System for Removal and Concentration of Transuranic Elements



Developer: LSR Technologies, Inc.
Contract Number: DE-AR21-96MC33080
Crosscutting Area: ESP

**Tanks
FOCUS AREA**

Problem:

The treatment and disposal of radioactive waste generated in past plutonium operations represents an immense technical and economic challenge. In the case of the Hanford tank sludge wastes, a baseline approach has been defined in which the sludges will be leached with a high caustic solution to dissolve certain nonradioactive components. The leached sludge, which contains transuranics (TRUs), Strontium-90 (^{90}Sr), etc. will then be vitrified for geologic disposal. The cost of this baseline scheme has been estimated to be \$3 billion. Furthermore, there may not be enough space available in a deep geological repository.

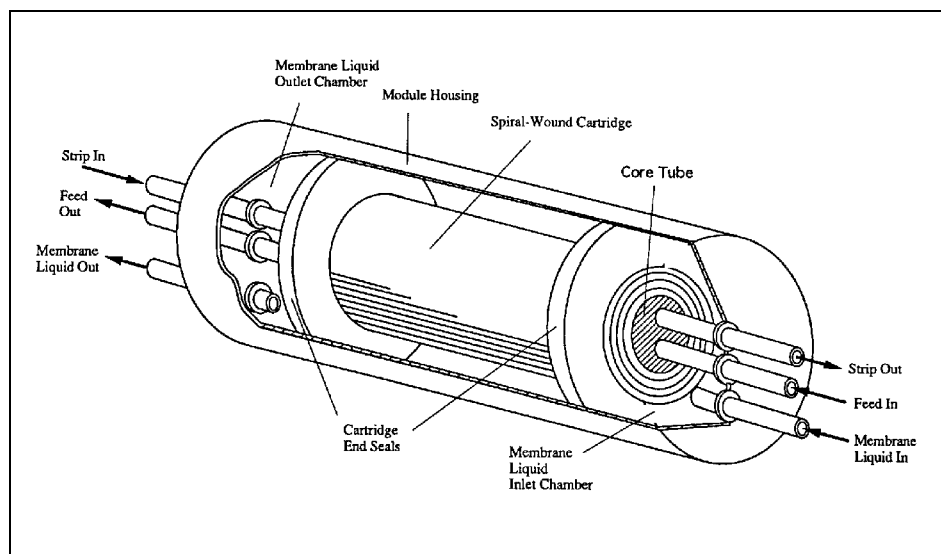
Solution:

There are technical and economic incentives to apply advanced processes to separate the radioactive and nonradioactive components of Hanford tank waste and drastically reduce the volume of high-level waste. The transuranic extraction (TRUEX) process and the strontium extraction (SREX) process have been proposed to accomplish this goal. Reliable,

efficient, and compact systems are required to successfully implement the TRUEX and SREX processes. A new Moving Liquid Membrane System (MLMS) will be employed for selective removal and concentration of TRUs and ^{90}Sr from dissolved tank waste, thereby minimizing the volume of high-level waste (HLW).

► Compact modular system with flexible operating conditions and automated controls for reduced worker exposure to radioactive environment

► Stable performance with reduced chemical and extractant consumption



Benefits:

- High TRUs and ^{90}Sr removal selectivity and concentration factor
- Significant reduction of HLW volume

Technology:

The overall goal of this project is to develop and demonstrate the MLMS for selective removal and concentration of transuranic elements and ^{90}Sr from radioactive waste streams. The unique MLMS



The technical challenges for using MLMS in the TRUEx and SREx processes are the development of radiation-resistant membrane modules and their evaluation using actual dissolved Hanford tank waste. The extractants for TRUs and ^{90}Sr are commercially available.

DOE's Morgantown Energy Technology Center supports the Environmental Management - Office of Science and Technology by contracting the research and development of new technologies for waste site characterization and cleanup. For information regarding this project, the DOE contact is:

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